AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 4065B

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ALUMINUM ALLOY TUBING, SEAMLESS
1.2Mn (3S-0)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. COMPOSITION:

Manganese	1.0 - 1.5
Iron	0.7 max
Silicon	0.6 max
Copper	0.20 max
Zinc	0.10 max
Other Impurities, each	0.05 max
Other Impurities, total	0.15 max
Aluminum	remainder

3. CONDITION: Annealed.

4. TECHNICAL REQUIREMENTS:

4.1 Tensile Properties:

Tensile Strength, psi	19,000 max

4.2 Flattening:

4.2.1 Tubing having nominal wall thickness less than 10% of the nominal outside Ø diameter shall be capable of being flattened sideways under a gradually applied load, flat upon itself while under load, without cracking.

4.2.1.1 If tubing does not pass the flattening test of 4.2.1, a section of the tubing not less than 1/2 in. in length and embracing 1/3 to 1/2 the circumference of the tube shall be capable of being bent around a mandrel Ø having a diameter equal to the nominal wall thickness, without cracking, until the specimen encloses at least 180 degrees of the pin circumference. The test shall be made with the axis of bend parallel to the axis of the tube and with inside of tube on inside of bend.

4.3 Flarability: Tubing with nominal OD of 0.375 in. and under shall be capable of being double-flared and tubing with nominal OD over 0.375 in. shall be capable of being single-flared without formation of cracks or other visible defects. Specimens for flaring may be cut from any portion of the tube, or an entire tube may be used as a specimen. The end of the specimen to be flared Ø shall be cut square, with the cut end smooth and free from burrs, but not rounded except for sizes 0.375 in. and under. The specimen shall, at room temperature, be forced axially with steady pressure over a hardened and polished tapered steel pin having a 74-degree included angle, to produce a flare having the permanent expanded OD specified in the following table:

Nominal OD Inch	Expanded OD Inch, min	Nominal OD Inch	Expanded OD Inch, min
0.125	0.224	0.750	0.937
0.188	0.302	1.000	1.187
0.250	0.359	1.250	1.500
0.312	0.421	1.500	1.721
0.375	0.484	1.750	2.106
0.500	0.656	2.000	2.356
0.626	0.781		

4.3.1 Ø Tubing with intermediate nominal OD shall take the same percentage flare as that for the next larger OD.

4.3.2 Ø Tubing with nominal OD greater than 2.00 in. shall have flarability as agreed upon by purchaser and vendor.

5. QUALITY: Tubing shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts.

6. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2203 as applicable to non-heat treatable alloys.

7. REPORTS:

7.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report stating that the chemical composition and tensile properties of the product conform to the requirements specified. This report shall include the purchase order number, material specification number, size, and quantity.

7.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment, three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

8. IDENTIFICATION:

8.1 Unless otherwise specified, each tube 0.25 in. and over in diameter shall be marked with the manufacturer's identification, and, in addition, the alloy name or number and temper, or AMS 4065. The characters shall be of such size as to be clearly legible, shall be applied recurring at intervals not exceeding 2 ft using a suitable marking fluid, and shall not be obliterated by normal handling or heat treatment.